

Milkweed Habitat:

Home Sweet Home

"Who's Got Milk (weed)?"



Hi there! I am a Budburst Scientist like you, and I have discovered something about milkweeds that I had not known before. Did you know that monarch butterflies, as adults, must find a milkweed plant to lay its eggs on? Only milkweed plants will do! So I learned that monarch caterpillars are only found on milkweed plants! When the momma butterfly's eggs grow into caterpillars, the caterpillars have a nice ready-made home amongst the green leaves of the milkweed. Home sweet home!

Here's something else new to me! The interactions between the milkweed and the monarchs that live on and around it have a name. It is called a symbiotic relationship. That's a mouthful! What I did not know is that the milkweed plant has <u>symbiotic relationships</u> with other organisms too. Sometimes scientists use the term Interspecies relationship, but I like the word symbiotic. It make me think of the word symbol – like a smiley face is an easy symbol I can draw to show I am happy. A symbiotic relationship refers to organisms that depend on each other for survival, food, shelter, etc. Sometimes one or more of the organisms are harmed in the relationship and sometimes each organism benefits.

A Predator-Prey Relationship:

For example, milkweed bugs (Fig.), milkweed longhorn beetles, and milkweed leaf beetles have all developed ways for using the toxins produced by the milkweed plant to provide their own defenses to keep away their predators. The larvae (caterpillars and grubs) eat the leaves of the milkweed plant and that bad tasting leaf actually tastes okay to them. It makes them taste bad to their predators! That is an example of a symbiotic relationship. It's a special type of symbiosis called **Predator-Prey** relationship. Can you think of a **predator** that might try to eat a nice juicy caterpillar (the poor **prey**)?

A Mutualistic Relationship:

The milkweed flowers are not picky about what insect <u>pollinates</u> them. As long as the <u>pollen</u> moves from one flower's stamen to the next flower's pistil, the flowers are happy! When the insects become adults, the milkweed leaves they ate as larvae continue to give them protection from <u>predators</u> (those organisms that would eat them for their next meal). So a bird (the predator) might try to eat the caterpillar or adult monarch (the prey), but would 'spit' it out because the insect now tastes bad! The milkweed also produces nectar that the adult insects eat. In the process of feeding on nectar, the insects accidentally pick up pollen grains and spread them from one milkweed flower to another, thus pollinating the milkweed flowers! All of the organisms are benefitted. So this symbiotic relationship is called a **mutualistic** relationship.

Oh! Here is another thing I learned! The insects that live on the milkweeds typically have warning colorations that advertise their toxicity to their predators (See Figures 1 and 3). That is why so many

insects found on milkweed plants have bright red or orange colorations or markings! I think that's the coolest thing of all! I wonder what a **food chain** might look in a milkweed habitat. The monarch caterpillar eats the milkweed leaves, a bird comes along (with no taste buds) and eats the caterpillar, then along comes a very large snake! The snake doesn't ever taste its food, swallowing the bird whole! Finally a hawk swoops down and picks up the poor unsuspecting snake to eat at the hawk's own special home (habitat), its favorite high up tree branch. Wow! That milkweed plant sure does help to support a lot of living things!!!

So, the milkweed provides nourishment and shelter for some of these animals, and these organisms enjoy a little protection in this natural setting - their milkweed **<u>habitat</u>**.



Figure 1. The three photos show adult and immature milkweed bugs and a very brightly colored larva.

I might have mentioned this earlier – that other animals like to make a milkweed plant their home. Take the milkweed tiger moth (*Euchaetes egle*) found throughout North America with a wing span up to 1 ³/₄ inches (Fig. 2); please, take it. It has dull grey, mostly unmarked wings and a hairy yellowish orange abdomen marked in black dots. The female moth will lay a mass of fuzzy white eggs on the undersides of leaves. The milkweed tussock caterpillar is the result when an egg hatches. The caterpillars feed together in large groups in the beginning. Soon they get large and wander off; their feedings can sever major leaf veins (completely cut the leaf in half) as they feed on older shoots and stems. They are usually not in competition with the monarch caterpillars' food, as monarch larvae prefer the younger, tenderer shoots and leaves of the milkweed plant.



Figure 2: The three photos show various stages of the milkweed tiger moth.

When winter is close at hand, the moth larvae will form gray cocoons, and they will become adults or stay in their pupae until the next spring. Their main predator is a bat. Since bats hunt at night, they do not see the bright colorations of the larvae. The moths have evolved to produce ultrasonic clicks that the bats can sense with their ultrasonic abilities to "see." Thus, over time, the bats have associated these moth ticks with a really bad taste and so avoid eating moths as their <u>prey</u>.





Figure 3: The large milkweed bug, on a leaf at left and on a milkweed pod on the right.

There are other organisms that live on and around the milkweed plants. Let's take a look at a true bug. The large milkweed bug (Figures 3 and 4) has mouthparts that can be inserted into a common milkweed seed pod and lay light lemon yellow eggs in crevices between the seed pods. One lady milkweed bug can deposit up to 30 eggs a day, every day for a month! These eggs change to a bright orange or red color just before they hatch out into babies (nymphs) that resemble the adults. These babies will remain together and feed on developing seeds; however, if the opportunity avails itself, they will feed



on monarch eggs and larvae too. Because they eat milkweed plant parts, they are poisonous to most <u>predators</u>. Only a desperate bird, grasshopper, or spider would bother to taste this bug! The bugs do not usually do much harm to the milkweed plant, as they eat mostly the seeds in the seed pods. There are other organisms that rely on the milkweed to survive and thrive. This is just a glimpse into a "Milkweed Habitat." How does this compare to your Home Sweet Home?

Figure 4: The large milkweed bug – a true bug.

Checking for Understanding:

How is a Milkweed Plant able to become a <u>Habitat</u>? Can you identify at least two <u>symbiotic relationships</u> between monarchs and milkweed plants? Can you create a simple <u>food chain</u> that starts with a milkweed plant and ends with a hawk? What organism(s) would you put between the plant and the hawk? If there were a snake, spider and a frog near a milkweed plant, could you create another simple food chain that would start with the milkweed plant and end with the snake? Name a <u>predator</u> and its <u>prey</u> from one of your food chains.

Vocabulary:

<u>Symbiotic relationship (interspecies relationship)</u>: When two or more organisms interact because they share the same habitat, they are said to have a symbiotic relationship. Sometimes the interactions are harmful to one organism but beneficial to the other. Predator-prey relationships would be an example of this. Example: When a wolf (predator) hunts down and eats a rabbit (its prey). An example of a symbiotic relations where both organisms are benefitted is called mutualism. Most pollinator- flower

relationships are examples of mutualism: A monarch butterfly lays its eggs on a milkweed plant where the caterpillars can grow and be safe from predators because the milkweed makes the caterpillars taste bad to predators. Meanwhile milkweed gets pollinated by adult butterflies (and other pollinators) when the adult butterflies visit milkweed flowers to get nectar to eat. The adult butterflies (and other pollinators) will pick up pollen from each flower to pollinate other flowers.

Ecosystem: An ecosystem is a community of living organisms that interact with each other and coexist because they all can survive in that particular place based on the daily temperature fluctuations, the average amount of precipitation that area receives, and the kind of soil, terrain, etc., that exists. The living organisms are called the biotic factors of that ecosystem, and the amount of precipitation, average annual temperatures, type of soil, etc., make up the nonliving or abiotic factors of that ecosystem. For example, a prairie ecosystem is usually composed of tall grasses, sunflower plants, and other plants that have deep roots. These plants must be able to survive fires caused by lightning strikes, periods of no rain, and hot summer temperatures. The animals living with them need to have ways to adapt to the same 'abiotic' (physical factors). These might be mice, meadowlarks, grass snakes, grasshoppers, bees, and butterflies.

<u>Habitat</u>: A habitat is the physical place (natural setting) in an ecosystem where the organisms get their physical needs satisfied. For example, a field mouse might live in a prairie and use the tall grasses for shelter, burrow in the ground to escape predators, and eat the seeds of the prairie plants for nourishment. How is a milkweed plant like a little habitat?

Food chain: A food chain shows what gets eaten by what starting with a plant.

Predator-Prey Relationship: A type of symbiotic relationship where one organism is harmed and the other is benefitted.

Predator: An animal that eats another animal for its nourishment.

<u>Prey</u>: The animal being eaten by the predator.

Mutualism: A type of symbiotic relationship where both organisms are benefitted in some way.

Pollen: The very fine, powdery substance needed by plants to produce seeds.

<u>Pollinate</u>: When pollen is transferred from the anther on the stamen of one flower to the stigma on the pistil of another flower by an animal like an insect or the wind.

<u>Abiotic factors</u>: All of the non-living things that impact an ecosystem. Ex: amount of precipitation the area receives over the course of a year.

Biotic factors: All of the living organisms that interact and impact an ecosystem.

Reference List

Details for some of the story:

Garvey, K. K. (December 5, 2016). *Bug Squad: Happenings in the insect world. "What are those red and black bugs on milkweed?"* University of California Agriculture and Natural Resources. Accessed on July 28, 2019 at: <u>https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=22729</u>

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